What is claimed is:

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1. A vacuum apparatus for removing water from a fire safety system, comprising:

a vessel for collecting fluid, said vessel having a fluid inlet aperture, a fluid egress aperture, and an air egress aperture;

a vacuum pump for generating a stable reduced pressure within said vessel, having a first conduit for withdrawing air from said vessel, said first conduit in fluid connection to said vessel at said air egress aperture, and a second conduit for expelling the air withdrawn from said vessel;

and a connector for fluidly linking the vessel to the fire safety system, said connector having a first and second end, said first end linked to the vessel at the fluid inlet aperture, and said second end having a fitting for linking to the fire safety system.

2. The apparatus of claim 1, further comprising a pressure regulator for maintaining the stable reduced pressure within said vessel, said regulator being in fluid connection with said vessel such that air is allowed to enter the vessel in order to maintain the stable reduced pressure.

3. The apparatus of claim 2, wherein said pressure regulator comprises an adjustable pressure valve and at least one gauge for measuring the pressure within the vessel mounted upon said vessel.

4. The apparatus of claim 1, wherein said the stable reduced pressure is between about 10 and about 30 inches Hg.

5. The apparatus of claim 1, wherein said vacuum pump maintains said reduced pressure within said vessel within the range of tolerances of the components in the fire safety system.

6. The apparatus of claim 1, wherein said vacuum pump comprises a motor for powering the vacuum pump and a piston assembly.

7. The apparatus of claim 6, wherein said motor has between about 2 to about 6 horsepower.

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8. The apparatus of claim 6, wherein said motor is a 3 to 5 horsepower electric, gasoline or diesel motor.

9. The apparatus of claim 1, wherein said fitting is a male to female or female to male reciprocal fitting.

10. The apparatus of claim 1, wherein said fitting is a friction fitting.

11. An apparatus for repairing a fire safety system by maintaining a reduced pressure within the system, comprising:

a vessel for maintaining the reduced pressure, said vessel having at least a first and second aperture in the vessel wall, said first aperture for joining the vessel to the fire safety system, a second aperture for withdrawing the air from the system;

a vacuum pump for generating a stable reduced pressure within said vessel, having a first conduit for withdrawing air from said vessel, said first conduit in fluid connection to said vessel at the second aperture, and a second conduit for expelling air, said second conduit venting to the atmosphere, and a filter for preventing water and debris contamination of the vacuum pump, said filter removeably mounted to said vacuum pump between said vessel and said vacuum pump within the air flow path of the first conduit; and

a hose for joining the vessel to the fire safety system, said hose having a first and second end, said first end attached to said first aperture, and said second end having a fitting for linking to the fire safety system.

wherein said vacuum pump maintains said reduced pressure within said vessel at between about 10 to about 30 inches Hg.

12. The apparatus of claim 11, wherein said vacuum pump further comprises a power source and a pump operably connected to said power source, said pump fluidly connected to the vessel through the first conduit between the filter and the second conduit.

13. The apparatus of claim 12, wherein said pump is a fan assembly.

14. The apparatus of claim 12, wherein said power source is a motor for powering the pump.

15. The apparatus of claim 12, wherein said power source has between about 3 to about 5 horsepower.

16. The apparatus of claim 11, further comprising a regulator, said regulator being in fluid connection to said vessel such that air is allowed to enter the vessel when the internal pressure is lower than about 10 to about 20 psig.

17. The apparatus of claim 16, wherein said regulator includes a spring valve.

18. The apparatus of claim 11, further comprising a third aperture for draining water from the vessel, said aperture located in the wall of the vessel and having a valve for allowing water to escape.

19. The apparatus of claim 11, wherein said fitting is half of a male to female or female to male reciprocal fitting.

20. The apparatus of claim 11, wherein said fitting is a friction fitting.

21. The apparatus of claim 11, wherein the apparatus is mounted on a frame for moving the apparatus.

22. A method of repairing a sprinkler system having damaged or defective sprinkler heads without water leakage from the sprinkler heads or the joints between the sprinkler heads and pipes of the system, comprising:

providing an apparatus for maintaining a stable reduced pressure within the system;

placing said apparatus in fluid connection with said sprinkler system;

creating a stable reduced pressure within said sprinkler system; and

removing said sprinkler heads.

23. The method of claim 22, wherein said apparatus is connected to a valve in the sprinkler system.

24. The method of claim 22, wherein said reduced pressure is between about 10 to 29.9 inches Hg.

25. The method of claim 22, wherein said pipes are breached by creating an opening in said pipes such that the inside of said pipes is exposed to the atmosphere.

26. A method of repairing sprinkler heads without releasing water trapped in pipe drops, comprising:

creating a stable pressure differential between the atmospheric pressure and the internal pressure within said sprinkler system; and

sequentially removing one or more at a time of the sprinkler heads.

27. The method of claim 26, wherein said pressure differential is 10 to 29.9 inches of Hg.

28. The method of claim 26, wherein the step of creating said stable pressure differential is performed by

draining the sprinkler system at a centrally located valve,

attaching a vacuum pump to the system, and

actuating the vacuum pump to generate the reduced pressure within the system.

29. The method of claim 26, wherein the step of creating a stable pressure differential includes the steps of attaching the apparatus of claim 1 to the sprinkler system, and actuating the apparatus of claim 1 to generate the stable pressure differential.

30. The method of claim 26, wherein the step of creating a stable pressure differential includes the steps of attaching the apparatus of claim 11 to the sprinkler system, and actuating the apparatus of claim 11 to generate the stable pressure differential.

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